

It seems to me that the specimen under discussion falls very little short of supplying the needed paleontological data on the antiquity of maize. Its very modern appearance may of course readily be interpreted as an indication of its comparatively recent age, but, on the other hand, there is more than a reasonable conjecture that it could be actually as old as has been suggested, in which case it shows that the real ancestors of maize must apparently be sought much earlier than has usually been assumed.

ZOOLOGY.—*The systematic position of the crinoid genus Holopus.*

AUSTIN H. CLARK. U. S. National Museum.

The systematic position of *Holopus* has never been definitely determined. In the latest general work on the Crinoidea¹ it was placed by Springer and Clark at the end of the Articulata, in Family 8, Holopidae, beyond Family 7, Eugeniocrinidae, and Family 6, Saccocomidae; but this disposition was admittedly provisional.

Holopus has frequently been associated with *Edriocrinus*, but it does not seem possible that the two can really be closely related.

In *Holopus* the disc, arms, and pinnules are so obviously of the same type as those of the pentacrinites and comatulids that the relationship with these forms can scarcely be denied. The arms of *Holopus* are very short and thick and closely appressed against each other; comparison, therefore, must be with the closely appressed arm bases of such types as *Endoxocrinus* or the genera of the Charitometridae (especially *Crinometra*) and not with the distal portions of the pentacrinite or comatulid arms, or with the widely separated arms of many forms. The asymmetry of *Holopus* is duplicated in many of the Comasteridae.

The disc of *Holopus* is identical in character with that of the very young of the comatulids in which perisomic plates are present—*Comactinia*, *Comissia*, *Thaumatocrinus*, and *Pentame-*

¹ Zittel-Eastman's "Paleontology," 1913, p. 241.

trocrinus—even to the detail of the slight eversion of the edges of the orals.

So far as I can see, the column of *Holopus* is composed of radials only. In the young specimen figured by Alexander Agassiz the uniformity of the ornamentation on the outer ring appears to indicate that it is composed of a single series of plates, which must be the radials. In one of the specimens figured by P. H. Carpenter² the series of tubercles running down the median line of each sector of the column indicates that the same plate (the radial) persists as far as this ornamentation extends, and probably also to the circumference of the basal disc.

An analysis of all the available characters³ indicates that *Holopus* occupies practically the same developmental plane as the pentacrinites and the comatulids; indeed it is questionable which of the three groups should be considered the most specialized.

My personal opinion is that the pentacrinites, the comatulids, and *Holopus* are very closely related, in spite of their extraordinary superficial dissimilarity.

In the pentacrinites the column is enormously developed; so rapid is the growth that the proximales as they are continuously formed beneath the calyx never succeed in becoming attached to it, but are continuously pushed outward by the formation of new proximales between the last formed and the calyx; the proximales later become separated by the intercalation of other columnals, appearing in the fully developed column as the cirriferous nodals. The basals are much reduced and lie horizontally.

In the comatulids a short column is formed and a proximale appears which, becoming firmly attached to the calyx, increases enormously in size and, the larval column being discarded, contains the entire adult stem. The basals, in nearly all the types, become metamorphosed into an internal septum and entirely lose their original character. The base therefore is entirely com-

² "Challenger" Report, *Stalked Crinoids*, 1884, plate III, fig. 1.

³ *Phylogenetic study of the recent crinoids*., *Smiths. Misc. Coll.* 65: No. 10. August 19, 1915.

posed of radials, practically horizontal in position, plus the proximale.

In *Holopus* the same line of specialization has apparently been followed further; the column and the basals have disappeared, and the attachment is by means of the radials, which in the comatulids dominated the base. It is conceivable that the very young *Holopus* is essentially like a short-stemmed comatulid in which the radials, growing very rapidly, form a cylindrical ring with the basals, spread outward until they all lie in the same plane, closing the proximal end, and that this ring becomes attached by its lower border to the object upon which the larva rests.

ANTHROPOLOGY.—*A second archeological note.*¹ TRUMAN MICHELSON, Bureau of American Ethnology.

Nearly three years ago I showed in this JOURNAL² that the provenience of the gray sandstone pipe discussed by Squier and Davis in their *Ancient monuments of the Mississippi Valley*, pages 249 and 250, must be the upper Mississippi region near the Rock River because the original of the pipe figured there is either the same as that of the Sauk pipe shown on plate 2 at the end of volume 2 of Beltrami's *Pilgrimage*, or it belongs to the same culture. It will be recalled that previously there was uncertainty as to the provenience of this pipe. I now find that the lowest of the three pipes shown on the plate facing page 279 of Em. Domenech's *Voyage pittoresque*, said to be from Tennessee, is also of the same culture; indeed it is almost impossible not to believe that the same artist fashioned all three pipes, so great is their likeness.

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² 6: 146. 1916.